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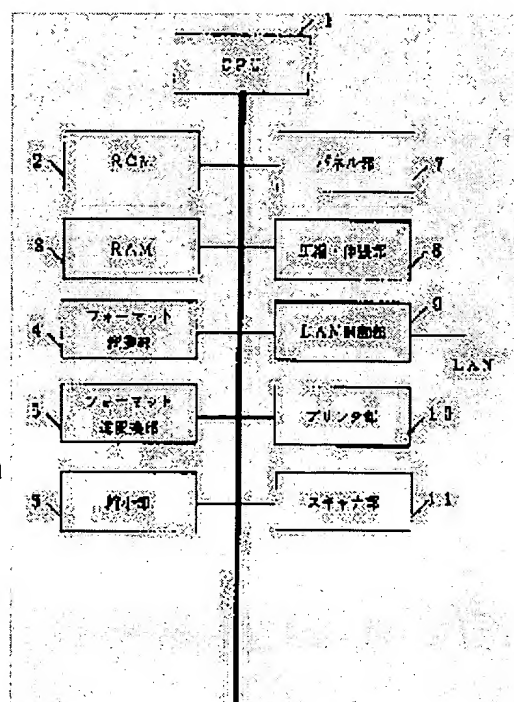
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(54) IMAGE DATA TRANSMITTING METHOD AND FACSIMILE-TYPE ELECTRONIC MAIL EQUIPMENT USING ELECTRONIC MAIL

(57)Abstract:

PROBLEM TO BE SOLVED: To communicate with communication equipments having mutually different paper size by reducing image data at the reception side to cancel the difference in the paper sheet size at a transmission side and the reception side which occurs at the time of transmitting/receiving image data as an electronic mail.

SOLUTION: The electronic mail received in a reception side equipment is obtained by reading image data from a scanner part 11, executing compression in a compression/extension part 8 and executing conversion into an electronic mail format by a format converting part 4. The electronic mail is converted into image data by a format reverse converting part 5. Then, the paper sheet size and resolution are obtained from the image data. Then, compressed image data is extended and the paper sheet size and the resolution of image data are compared with the



ones which are dealt in the reception side equipment. When the ability of the reception side equipment is lower, reduction to the paper sheet size which is dealt at the reception side is executed in a reducing part 6 so as to execute printing.

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image-data transmitting approach and facsimile mold electronic mail equipment using the electronic mail which can transmit and receive an image data by the same easy actuation as facsimile.

[0002]

[Description of the Prior Art] In recent years, office equipment is connected to LAN (local network), and the inclination to attain the increase in efficiency of business is increasing. The usage which connects facsimile to LAN and is referred to as using it as a printer or transmitting the document drawn up with the personal computer to the facsimile of the destination via LAN is also one of them. In JP, 7-143309, A, the equipment which sends the text document drawn up with the electronic mail on a personal computer to the facsimile apparatus of the destination via LAN is proposed.

[0003] Drawing 19 is the outline block diagram of the facsimile apparatus using the conventional electronic mail. 101 is CPU and controls equipment. 102 is ROM and a program is stored. 103 is RAM and is used as an object for the data of a program. 107 is the panel section and directs transmission. 108 is compression / elongation section and performs compression or elongation of an image data. 109 is a LAN control section and controls transmission or reception of the data from LAN of data to LAN. 110 is the printer section and prints data. 111 is the scanner section and reads a manuscript. 113 is the FAX communications department and receives the compressed image data from transmission or the telephone line to the telephone line. 120 is an alphabetic character and the image transformation section, and changes into an image data the text of the electronic mail received from LAN.

[0004] Actuation until it receives an electronic mail and transmits to facsimile hereafter is explained. If an electronic mail is received from the LAN section 109, the text of an electronic mail will be changed into an image data in an alphabetic character and the image transformation section 120, and an image data will be further compressed in compression / elongation section 108. The image data compressed into the FAX number described in the destination section of an electronic mail is transmitted from the FAX communications department 113.

[0005]

[Problem(s) to be Solved by the Invention] However, with the above-mentioned conventional configuration, the electronic mail of a text is changed into an image data, and it transmits to facsimile, and when the paper sizes which can treat a sending set and a receiving set differ further, by E-mail, the negotiation of this capacity cannot be performed. Moreover, anyone can use this equipment as a relay aircraft, and it can transmit to facsimile, and the owner of this equipment has to pay the traffic to facsimile, and may receive disadvantageous profit. Moreover, when the transmitting error to facsimile occurs, it has the trouble that the user who transmitted the electronic mail cannot know an error.

[0006]

[Means for Solving the Problem] This invention can make the transmitters from which a paper size differs communicate by having the configuration of adding the size of this image data to the image data

read in the transmitting side, changing into a format of an electronic mail gestalt, transmitting this by E-mail, changing into the paper size which can be treated by the self-opportunity based on the size of the image data which received by E-mail in the receiving side in order to solve the above-mentioned technical problem, and carrying out printing processing.

[0007] Moreover, this invention can prevent being used for others without notice, when performing junction etc. by having the means of communications which communicates using an electronic mail, an encryption means to encipher a part of image data which communicated by this means of communications, the control means which adds to said image data by making into a character string what was enciphered with this encryption means, and is made to communicate by said means of communications, and a configuration.

[0008] Moreover, a transmitting error can be known by having a configuration called a receiving means receive an image data and header information through the network of an electronic mail, a transfer means transmit the image data which received with this receiving means in a facsimile procedure, and a notice means will notify an error to the sending agency address shown in said header information if an error occurs during transfer processing with this transfer means.

[0009]

[Embodiment of the Invention] In case invention of this invention according to claim 1 to 9 transmits after changing the read image data into a format of an electronic mail, and it receives, after it changes a format of an electronic mail into a format of facsimile conversely, it is printed by the printer. When the paper sizes which can treat a sending set and a receiving set differ in the case of this communication link, the difference of capacity is solved by carrying out contraction processing of the image data by the receiving side.

[0010] Invention according to claim 10 to 13 enables the junction function from an electronic mail to facsimile by forming a password in a relay aircraft so that the owner of equipment may not receive disadvantageous profit.

[0011] Invention according to claim 14 to 15 enables the transmitting person of a manuscript to get to know the error of facsimile transmission.

[0012] Hereafter, the 1st example of this invention is explained, referring to a drawing. Drawing 1 is the system concept Fig. showing the environment where this equipment operates. This equipment operates in the environment where the electronic mail on the Internet can be used. That is, the e-mail gateway is connected with the Internet and the electronic mail in LAN communicates with the Internet via this e-mail gateway altogether. Although the protocol of an electronic mail is exchanged by SMTP (Simple Mail Transfer Protocol), POP (Post Office Protocol) can also be used. This equipment is premised on the communication link of these equipments for PC (personal computer) except for the 7th example in the following examples, although this equipment and the equipment of this configuration can transmit and receive an electronic mail.

[0013] Drawing 2 is an outline block diagram which reduces an image size by the receiving side. 1 is CPU and controls equipment. 2 is ROM and a program is stored. 3 is RAM and is used as an object for the data of a program. 4 is the format conversion section and changes an image data into a format of an electronic mail. 5 is the format inverse transformation section and is changed into the image data which treats the data of an electronic mail by facsimile. 7 is the panel section and directs transmission. 8 is compression / elongation section and performs compression or elongation of an image data. 9 is a LAN control section and controls transmission or reception of the data from LAN of data to LAN. 10 is the printer section and prints data. 11 is the scanner section and reads a manuscript.

[0014] Drawing 3 shows the flow chart which reduces an image by the receiving side. An electronic mail is received at step s1. The electronic mail received with this equipment reads an image data from the scanner section 11 of this equipment and the equipment of the same configuration, and after compressing in compression / elongation section 8, it carries out format conversion to a format of an electronic mail in the format conversion section 5. Format inverse transformation of the electronic mail is carried out to an image data by s2. Format conversion and inverse transformation are explained later. A paper size and resolution are obtained from an image data by s3. The image data compressed by s4 is

elongated. s5 compares with the paper size of an image data, the paper size which can treat resolution with this equipment, and resolution. If it turns out by s6 that the capacity of this equipment is lower, it will reduce to the paper size which can treat this equipment for an image data by s7, and will print by s8. Here, it is processible into a more legible image by matching a paper size and resolution and acquiring both information. For example, resolution can double with a small paper size by thinning out in high resolution, when a paper size is small like 200DPI.

[0015] The flow of conversion to an electronic mail format and inverse transformation and its concept are shown in drawing 4. The binary image data into which the attribute and page of the pointer (address on memory) to a paper size, resolution, the byte count for 1 page, and the following page etc. were compressed became a pair, and, as for the image data, it is located in a line two or more pages. Although the electronic mail converted the binary image data with the text code, it is the format which added the header upwards. Since SMTP which is the protocol of an electronic mail cannot carry binary data, it has converted the image data (attribute area and binary data area) with the text code according to a predetermined algorithm. In addition, although the direction of a format of an electronic mail is small drawn in drawing 4, since amount of information has much direction changed into a text code in practice, the format of an electronic mail is larger as information.

[0016] The example of the header of e-mail is shown in drawing 5. MIME of the first line shows that this mail can treat not only a text but an image and voice by the abbreviation for specification Multipurpose Internet Mail Extensions of an electronic mail. The first part is the text section bordering on ---, and the second part is the image section. An image data is added at the end.

[0017] Thus, according to the 1st example of the above, the difference in the capacity of the paper size which can treat the transmitting side produced when an image data is transmitted and received as an electronic mail, and a receiving side is solved by carrying out contraction processing of the image data by the receiving side.

[0018] Next, the drawing 6 transmitting side explains the 2nd example of this invention with reference to the outline block diagram which reduces an image size. This example takes the contraction section 6 from the configuration of the 1st example shown in drawing 2, and when reading an image from a scanner, it adds the optical contraction section 12 reduced optically. Since a manuscript is reduced optically, the quality of the result reduced as compared with the example 1 may become good.

[0019] The flow chart which communicates with the destination and performs image contraction by the transmitting side before transmitting to drawing 7 is shown. A form is set to the scanner section 11 by s11, and the destination is specified in the panel section 7. This equipment communicates on the equipment of the destination, and the Internet by s12, and the paper size which can treat the equipment of the destination, and resolution are obtained. Although equipment just stretches a connection by one to one, this communication link has a firewall in between, and when a connection is not swollen, it may use an electronic mail. However, before acquiring a partner's capacity by E-mail, it will take time amount. If a partner's equipment has capacity lower than this equipment at s13, in case a manuscript is read from the scanner section 11, according to partner equipment, a manuscript will be reduced in the optical contraction section 12. An image is compressed in compression / elongation section 8 by s14, and it changes into a format of an electronic mail in the format conversion section 4. An electronic mail is transmitted from the LAN control section 9 by s15.

[0020] Thus, since according to the 2nd example of the above the paper size of the destination can be known before transmitting, a manuscript can be reduced optically and the quality of the result reduced as compared with the example 1 may become good.

[0021] Next, the drawing 8 compaction registration explains the 3rd example of this invention with reference to the flow chart which registers the paper size of the destination, and resolution. The block diagram is the same as that of drawing 6. Since this example will require time amount if the capacity of the equipment of the destination is acquired by E-mail, when carrying out compaction registration, the capacity of the destination is acquired, and when actually transmitting, the time amount which communicates with the destination and an electronic mail is saved.

[0022] Compaction registration of the destination is specified from the panel section 7 by s21. It

communicates with the destination and an electronic mail by s22, and the paper size which can treat the equipment of the destination, and resolution are obtained. The capacity that the destination can be treated, such as a paper size and resolution, is registered into the abbreviated number of the destination by s33. This data is memorized by RAM3 and backed up by the dc-battery. Transmission is performed according to the flow chart which reduces an image according to the paper size registered into the drawing 9 abbreviated number. A manuscript is set to the scanner section 11 by s31, and the abbreviated number of the destination is specified from the panel section 7. The paper size which can treat the equipment of the destination registered into the abbreviated number by s31, and resolution are acquired, and when smaller [than the manuscript which it is going to read] and reading a manuscript from a scanner by s33, it reduces optically. An image is changed into a format of an electronic mail by s34, and an electronic mail is transmitted from the LAN control section 9 by s35.

[0023] Thus, since according to the 3rd example of the above the capacity of the destination is acquired when carrying out compaction registration, when actually transmitting, the time amount which communicates with the destination and an electronic mail can be saved.

[0024] Next, the 4th example of this invention is explained with reference to the outline block diagram which performs junction to the drawing 10 facsimile. This invention gives the junction function which receives an electronic mail with an image data and is transmitted to facsimile. In this case, the password was formed in the relay aircraft so that an unspecified third person might not bring the owner of equipment disadvantageous profit using equipment. This example adds encryption, and the code and the compound section 14 which are compound-ized for the FAX communications department 13 which controls the communication link with facsimile in the configuration of the 1st example shown in drawing 2 , and the password of a relay aircraft.

[0025] The flow chart transmitted to repeating installation at drawing 11 is shown. A manuscript is set to the scanner section 11 by s41, and repeating installation and the destination are specified from the panel section 7. The character string which directs facsimile transmission by s42 is added to an electronic mail. The password corresponding to repeating installation is searched with s43 from the relay aircraft list of drawing 12 , and it enciphers, and adds to an electronic mail. The owner of this equipment registers the relay aircraft list of drawing 12 beforehand. The password enciphered as the character string which directs facsimile transmission is added to the 5 or 6th line from on the header of the drawing 5 mail. An electronic mail is transmitted by s44.

[0026] The flow chart which analyzes a character string with repeating installation to drawing 13 is shown. The electronic mail with which the character string which directs facsimile transmission by s51 was added is received. The character string added to the electronic mail by s52 is analyzed, and if a character string called relay in the 5th line of drawing 5 is found, it will be interpreted as this electronic mail directing transmission in facsimile. If it judges that facsimile transmission is directed by s53, the enciphered password which is in the 6th line of drawing 5 by s55 will be compound-ized. relay which is in the 5th line of drawing 5 by s57 if the password compound-ized by s56 is in agreement with the password which the owner of this equipment registered into this equipment beforehand Format inverse transformation of the electronic mail is carried out to the number of the continuing facsimile, and it transmits to it from the FAX communications department 13. When it is judged that it is not facsimile transmission in s53, format inverse transformation of the electronic mail is carried out by s54, and it prints from the printer section 10. When a password is not in agreement by s56, the purport of an error is transmitted to the transmitting origin of an electronic mail by E-mail by s58.

[0027] Thus, according to the 4th example of the above, since the junction function was given to the 1st example, communication link cost can be saved compared with the usual facsimile communication (if it is just going to use the Internet by the monthly amount fixed system). Moreover, an unspecified third person does not bring the owner of equipment disadvantageous profit using equipment, using the device of the conventional electronic mail, since it enciphers to an electronic mail and the password of a relay aircraft was added.

[0028] Next, the drawing 14 image data is explained for it with reference to encryption, using the 5th example of this invention as a key. When a password is enciphered and it adds to an electronic mail as a

character string, a third person is able to read this character string. This enciphered password can be added to an electronic mail using a personal computer etc., and a relay aircraft can be abused. Then, since the password which transmits the password which this invention should have enciphered the password using the image data which is a part of transmit information of an electronic mail, and should have been enciphered even if read by others and which was enciphered for every manuscript changed, it prevented from using this equipment as a relay aircraft. The block diagram is the same as drawing 10.

[0029] In drawing 14, it is considering as the key of encryption of the 5 or 50,100th byte of data from the last of an image data as an example. In case equipment is set up, it determines which data are chosen. If a password is set to "123ABC", a code (ASCII code) will be set to "313233414243." If the key of encryption sets to 01, 7E, and 10, respectively, this data will be repeated and it will double with the die length of a password (it repeats twice by a diagram). Next, the bit of the key of encryption carries out bit flipping of the data of the password which is 1. A result serves as "304C23403C53." When compound-izing, it will become the password of a basis if bit flipping is carried out based on the key of encryption. The detail of a reversal process is shown in drawing 15. If the key of encryption is developed to a binary number in drawing, "01" will turn into "00000001." "31" of a password is similarly set to "00110001." Here, if the key of encryption of the digit expressed in the password as "1" is reversed (0->1, 1->0), it will be set to "00110000", and it will be set to 30 if this is changed into an ASCII code. If such a reversal process is performed, a result mentioned above will be brought.

[0030] A strange thing good among information transmitted, such as time added to the electronic mail instead of an image data as a key of encryption, may be used.

[0031] Thus, since the password which transmits the password which should have been enciphered by enciphering a password using the image data which is a part of transmit information of an electronic mail even if read by others and which was enciphered for every manuscript changes according to the 5th example of the above, the third person who does not know a password cannot use this equipment as a relay aircraft.

[0032] Next, the 6th example of this invention is explained with reference to a flow chart in case the drawing 16 facsimile transmission is an error. The block diagram of equipment is the same as that of drawing 10. The addresser of an electronic mail enables it, as for this invention, to get to know the transmitting error when receiving the electronic mail of an image data and transmitting to facsimile.

[0033] It is the same as that of the 4th example until it receives an electronic mail from the LAN control section 9 by s51 of drawing 16 and transmits to the facsimile of the destination by s57. When the error of facsimile transmission arises in s61, an electronic mail notifies the purport of an error to the transmitting origin indicated by the header of an electronic mail by s62.

[0034] Thus, according to the 6th example of the above, the addresser of an electronic mail can know by E-mail that the relay aircraft failed in facsimile transmission.

[0035] Next, the 7th example of this invention is explained with reference to the outline block diagram which receives the drawing 17 print directions and carries out facsimile transmission. Drawing 17 adds the print data analysis section 20 which analyzes the print data received from the LAN control section 9 except for the format conversion section 5 and the format inverse transformation section 6 of an outline block diagram which perform junction to the drawing 10 facsimile.

[0036] The program which inserts beforehand the e-mail address of the destination which carries out facsimile transmission, and the error notification point into print data is installed in the terminal (personal computer) which outputs print data. If the user of a personal computer directs a print from applications, such as a word processor, this program will be started, and a user is urged to input the destination which carries out facsimile transmission. An input of the destination transmits the print data which changed the data of applications, such as a word processor, into the image data to this equipment through LAN. The e-mail address of the error notification point starts this program, and registers it beforehand.

[0037] The flow chart which receives print directions to drawing 18 and carries out facsimile transmission is shown. A LPD protocol (print protocol for LAN) receives print data by s71. Next, the print data received by s72 are analyzed in the print data analysis section 20, and the facsimile number of

the destination is taken out. When the error of facsimile transmission arises in s73, the e-mail address of the error notification point is taken out from print data in the print data analysis section 20, and the purport of an error is notified to the e-mail address.

[0038] Thus, according to the 7th example of the above, data can be transmitted to the facsimile of the destination with the print directions from a personal computer, and when the error of facsimile transmission arises, the user who did print directions can know this error through an electronic mail.

[0039]

[Effect of the Invention] As explained above, in this invention, the capacity difference in the paper size which can treat the transmitting side produced when an image data is transmitted and received as an electronic mail, and a receiving side is solved by carrying out contraction processing of the image data by the receiving side.

[0040] Furthermore, since the paper size of the destination can be known before transmitting, a manuscript can be reduced optically and the quality of the reduced result becomes good.

[0041] Furthermore, since the capacity of the destination is acquired when carrying out compaction registration, when actually transmitting, the time amount which communicates with the destination and an electronic mail can be saved.

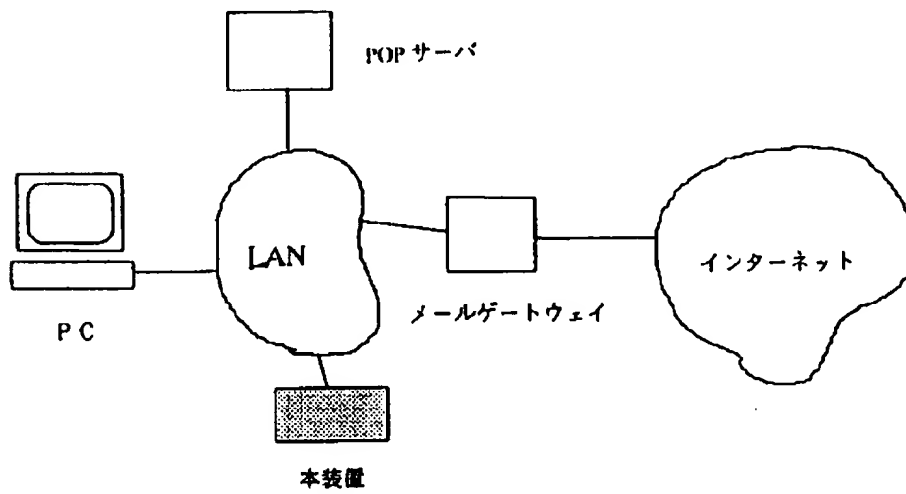
[0042] Moreover, in this invention, an unspecified third person does not bring the owner of equipment disadvantageous profit using equipment, using the device of the conventional electronic mail, since communication link cost can be saved from the usual facsimile communication, and the password of a relay aircraft is enciphered to an electronic mail, since the junction function was given, and it was made to add.

[0043] Furthermore, since the password which transmits the password which should have been enciphered by enciphering a password using the image data which is a part of transmit information of an electronic mail even if read by others and which was enciphered for every manuscript changes, the third person who does not know a password cannot use this equipment as a relay aircraft.

[0044] Moreover, in this invention, the addresser of an electronic mail can know by E-mail that the relay aircraft failed in facsimile transmission.

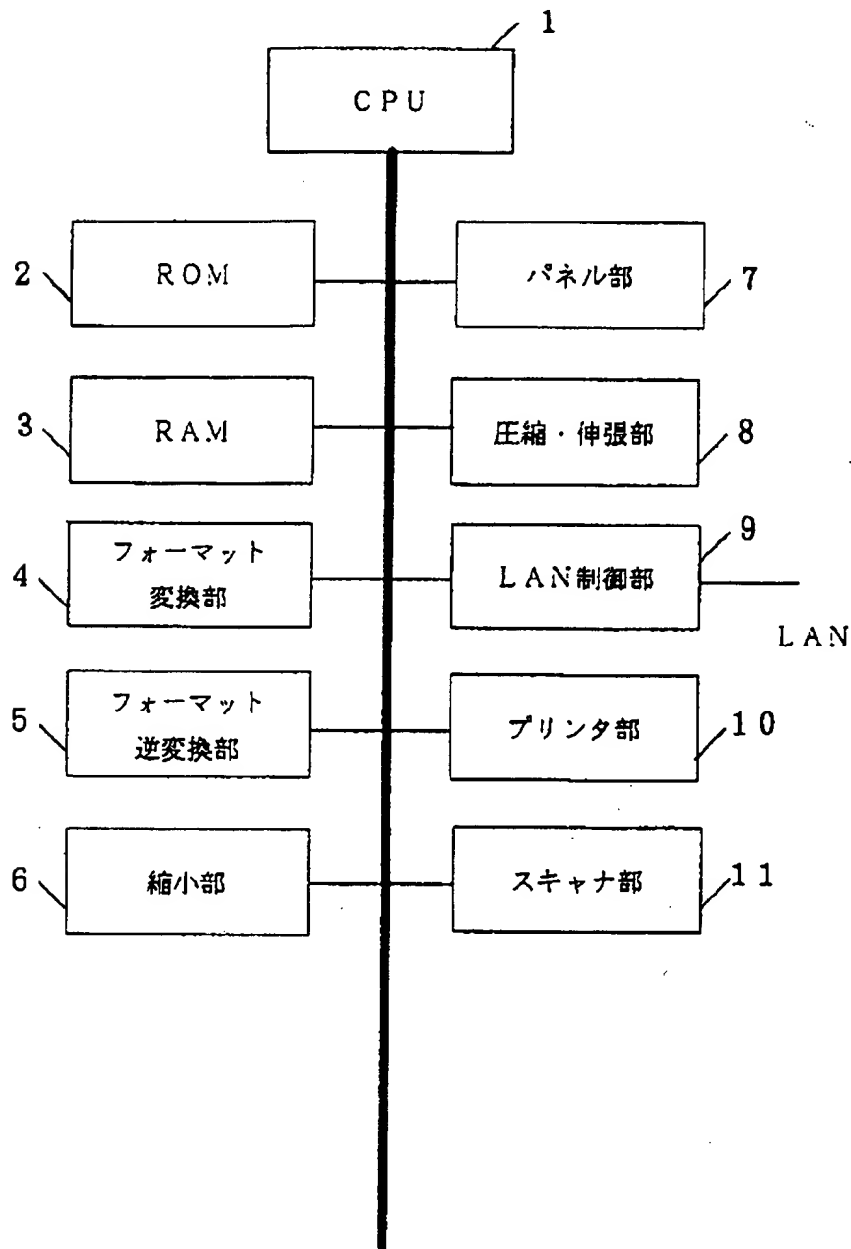

[0045] Furthermore, data can be transmitted to the facsimile of the destination with the print directions from a personal computer, and when the error of facsimile transmission arises, the user who did print directions can know this error through an electronic mail.

[Translation done.]

Drawing selection drawing 1 

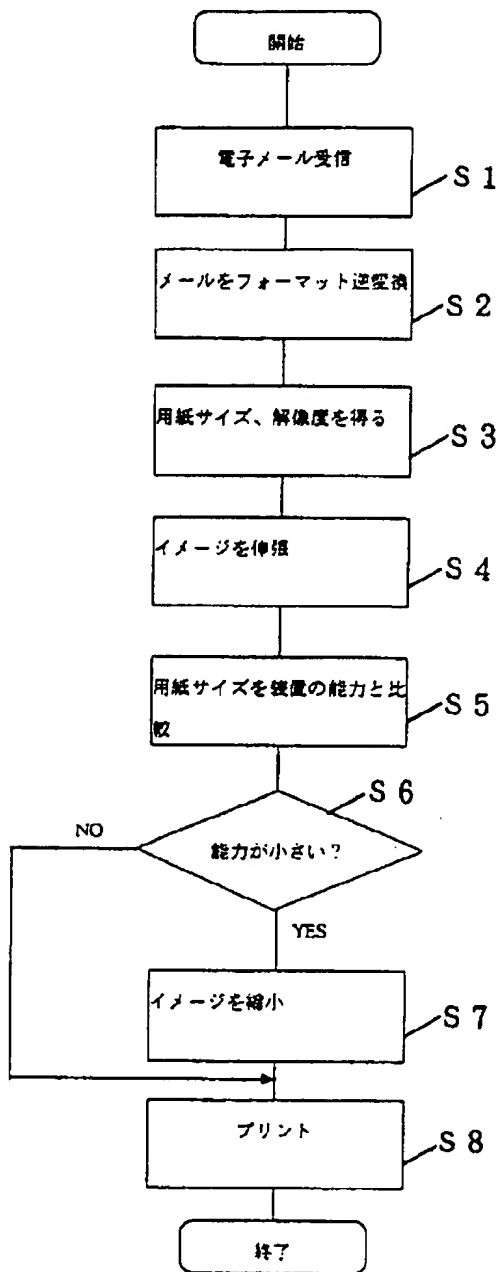
本装置が動作する環境

[Translation done.]

Drawing selection 

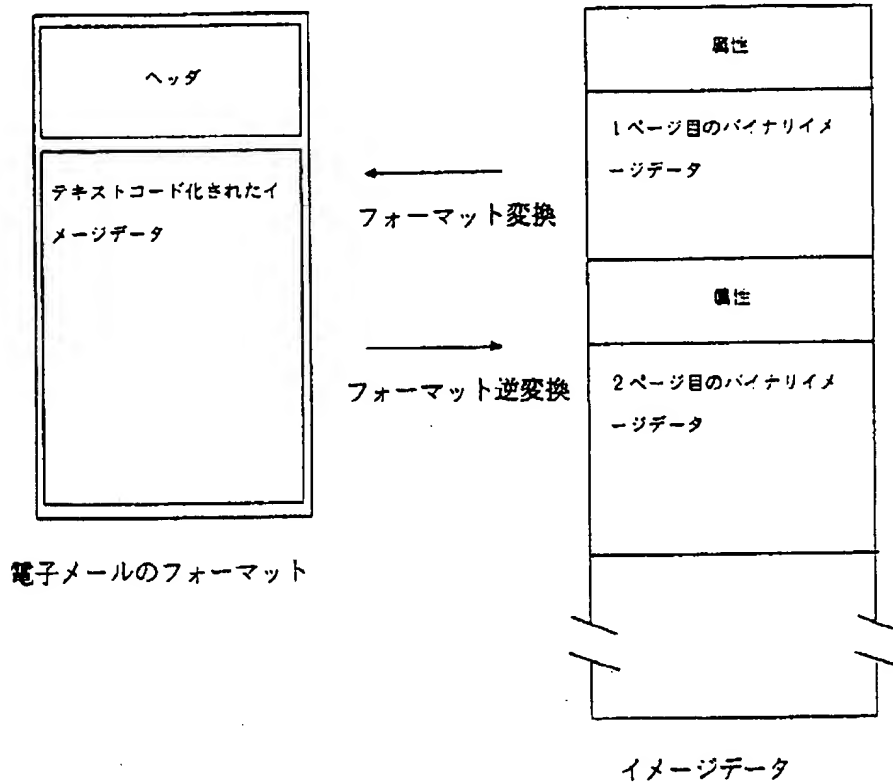

受信側でイメージサイズの縮小を行う概略ブロック図

[Translation done.]

Drawing selection drawing 3


受信側でイメージの縮小を行うフロー

[Translation done.]

Drawing selection drawing 4 

電子メールフォーマットへの変換と逆変換

[Translation done.]

Drawing selection 

MIME-Version:1.0

Content-Type: Multipart/mixed; charset=ISO-2022-jp;boundary=-

Content-Type: Text/plain; charset=ISO-2022-jp

relay 3491-9191. 宛先FAX番号

xxxxxxxxxx パスワード

The TIFF image file follows this text.

} → インターネットFAXを
中継機として使うときは
この部分が異なる。

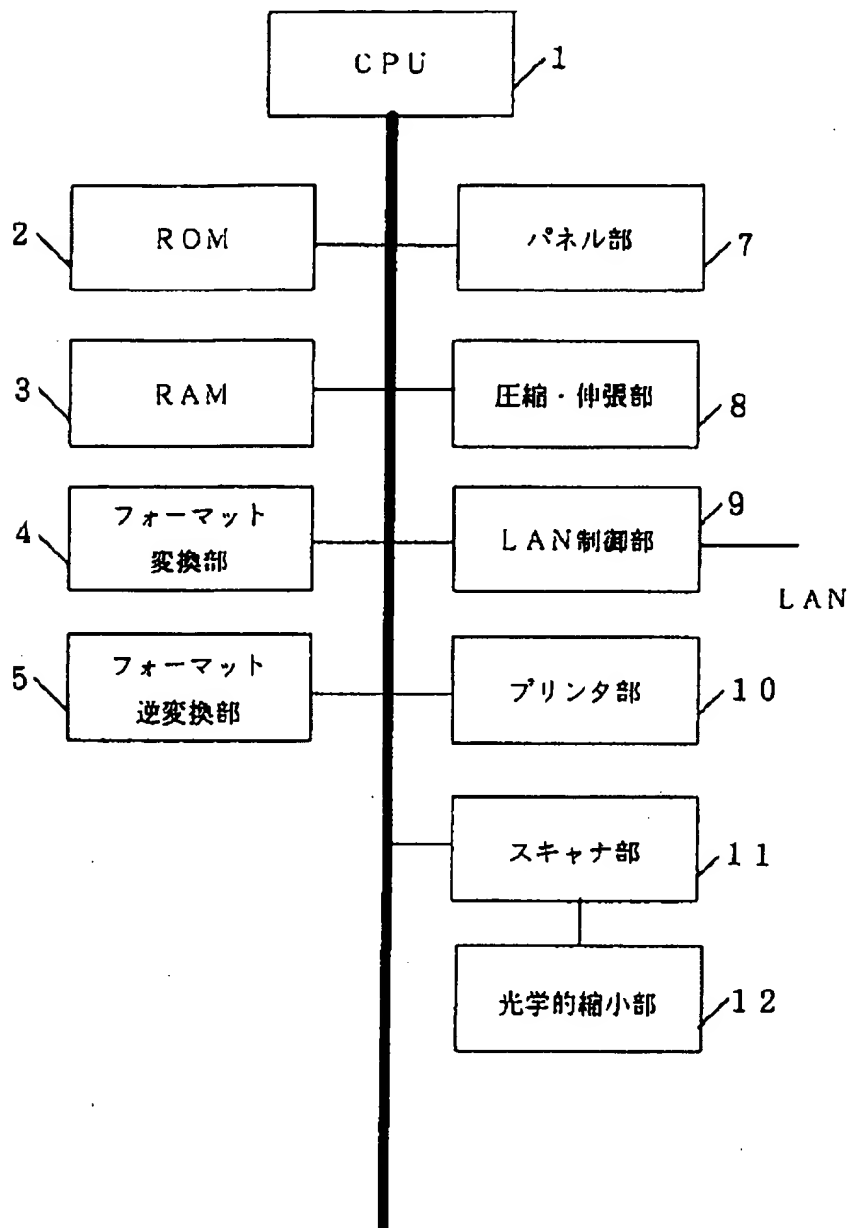
Content-Type: image/tiff

Content-Transfer-Encoding: base64

イメージデータ

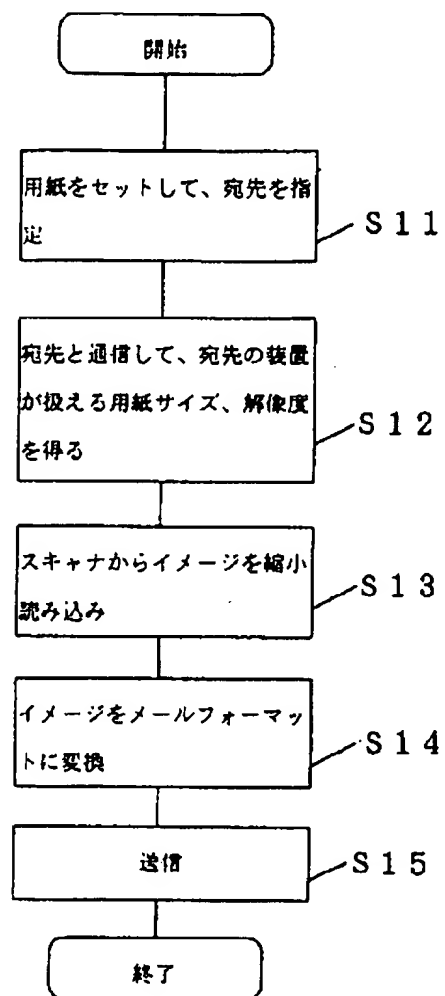
電子メールのヘッダ

[Translation done.]

Drawing selection 

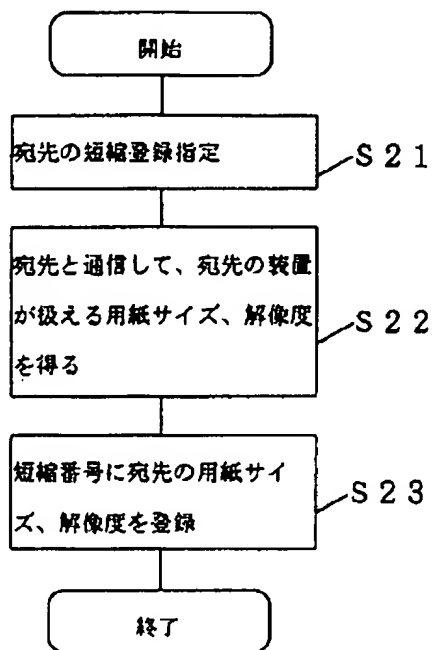
送信側でイメージサイズの縮小を行う概略ブロック図

[Translation done.]

Drawing selection 

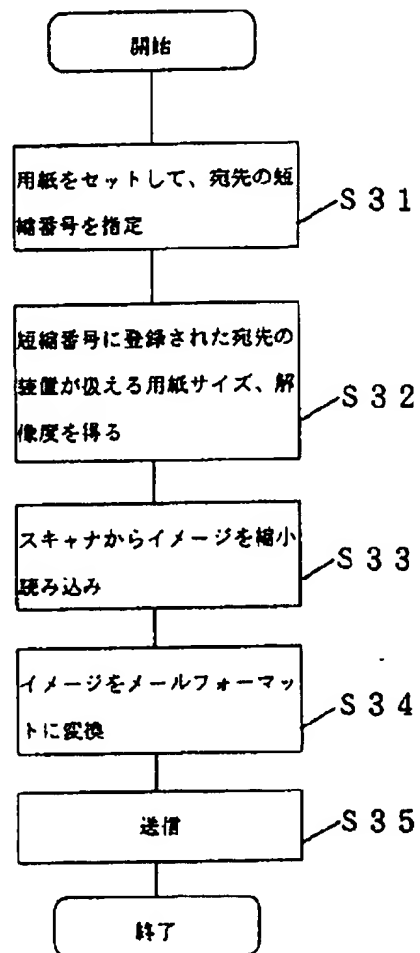
送信前に宛先と通信して送信側でイメージの縮小を行うフロー

[Translation done.]

Drawing selection 

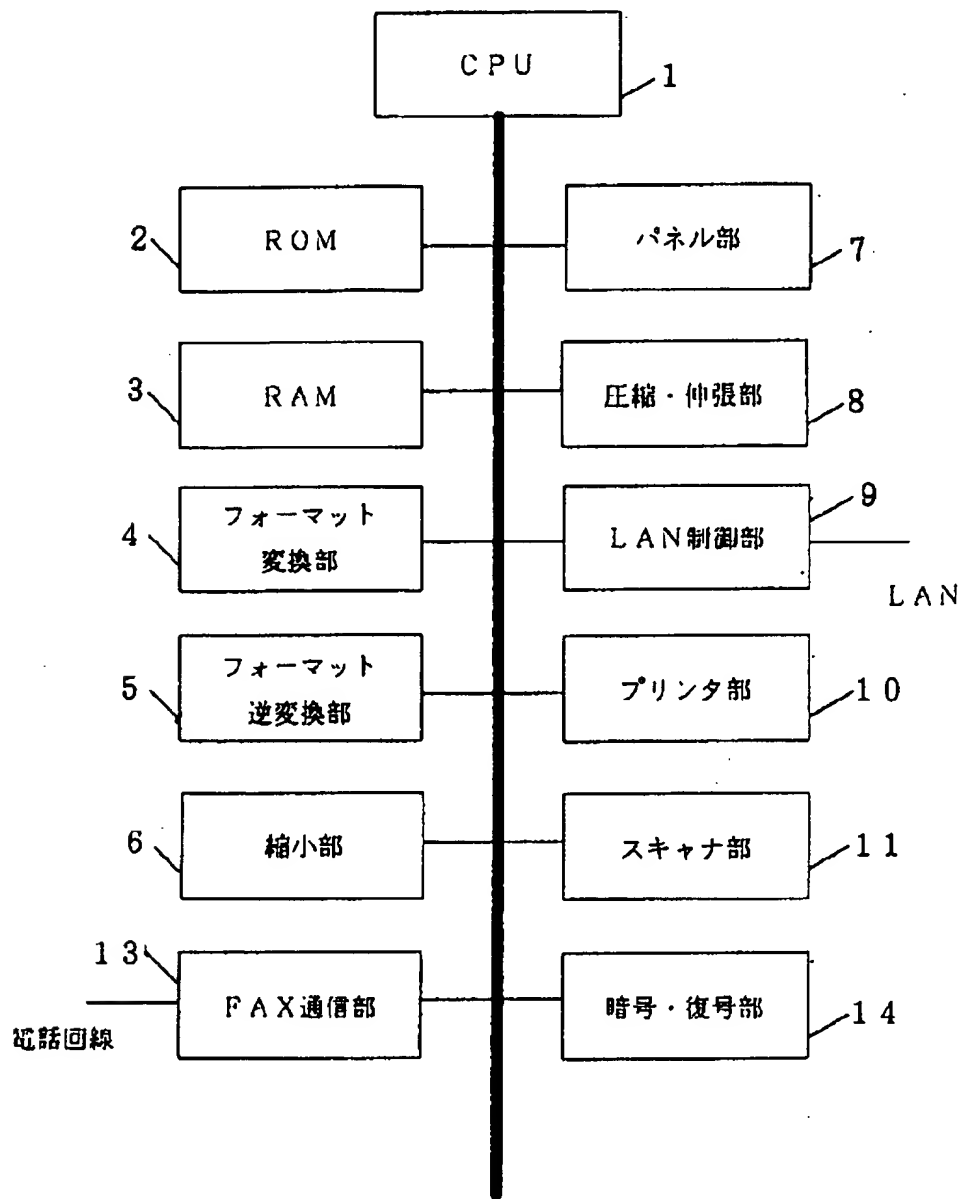
短縮登録で宛先の用紙サイズ、解像度を登録するフロー

[Translation done.]

Drawing selection drawing 9

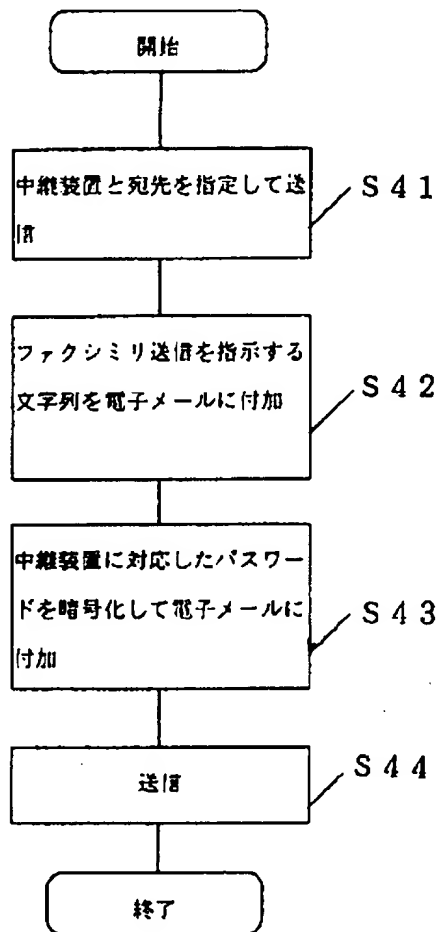

短縮番号に登録された用紙サイズに合わせてイメージの縮小を行うフロー

[Translation done.]

Drawing selection 


ファクシミリへの中継を行う概略ブロック図

[Translation done.]

Drawing selection drawing 11 

中継装置に送信するフロー

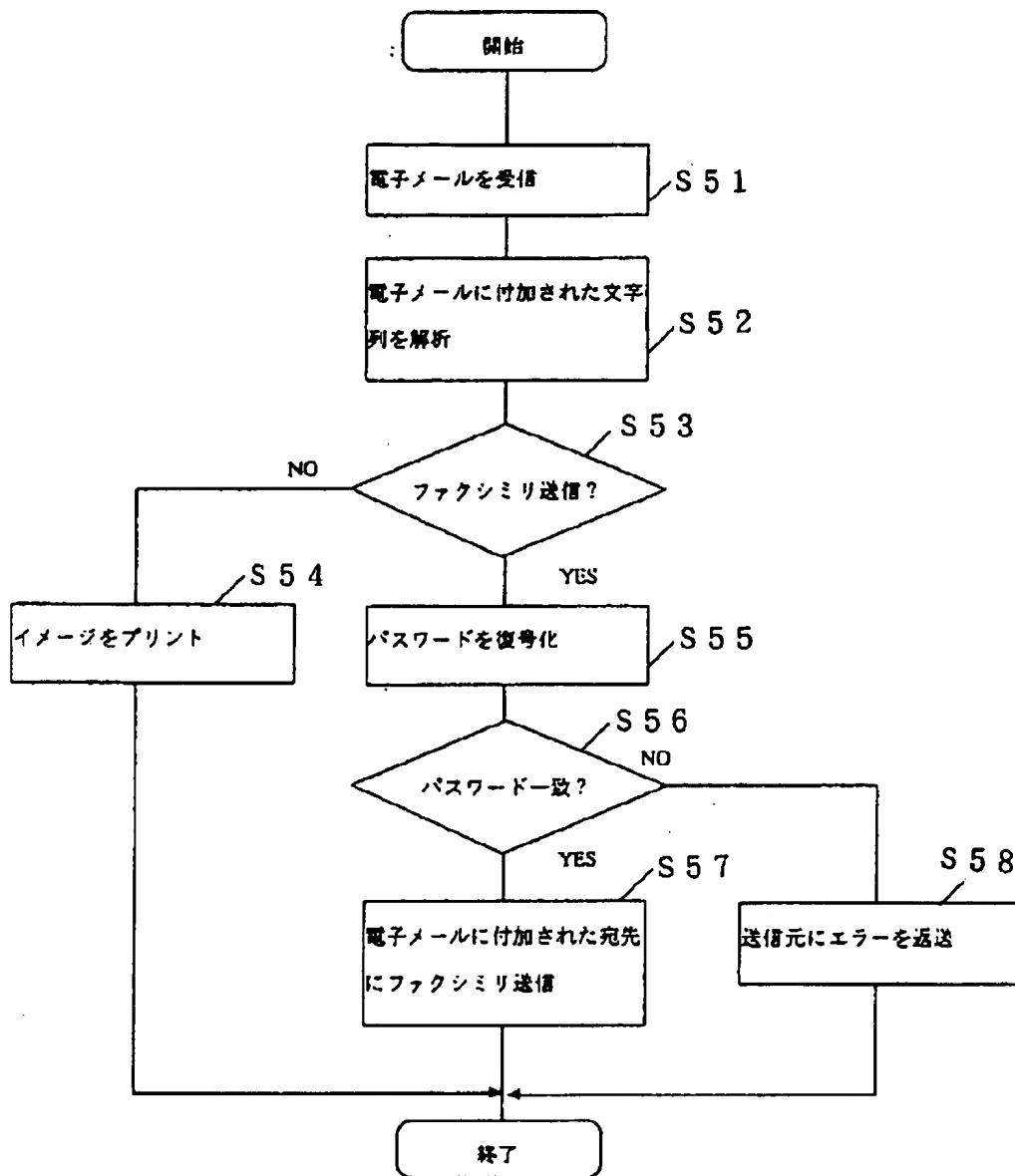
[Translation done.]

Drawing selection 

中継機番号	メールアドレス	パスワード	宛先名
1234	relay1@mgcs.mel.co.jp	passwd0001	松下
2345	relay2@aaa.com	0987654321	米国
		.	
		.	
		.	

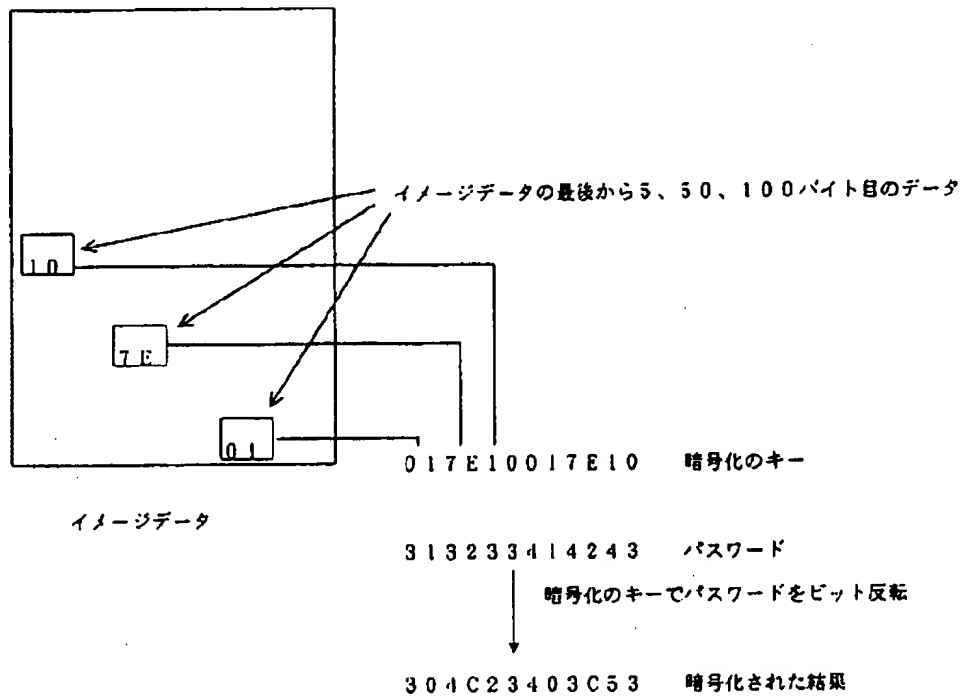

中継機リスト

[Translation done.]

Drawing selection drawing 13


中継装置で文字列を解析するフロー

[Translation done.]

Drawing selection drawing 14 

イメージデータをキーとした暗号化

[Translation done.]

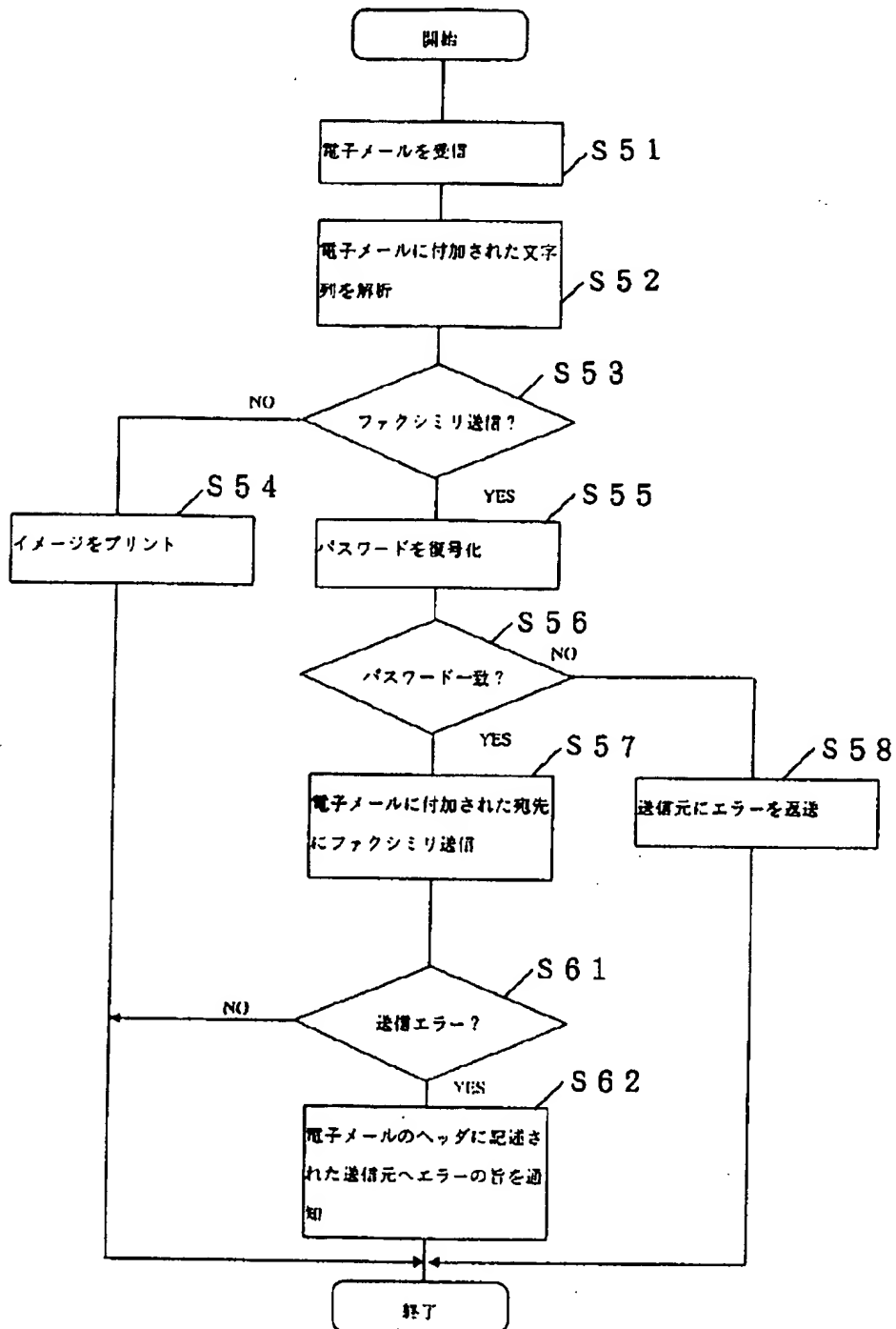
Drawing selection 

暗号化のキー 0 1 → 0000 0001
パスワード 3 1 → 0011 0001

↓ 反転

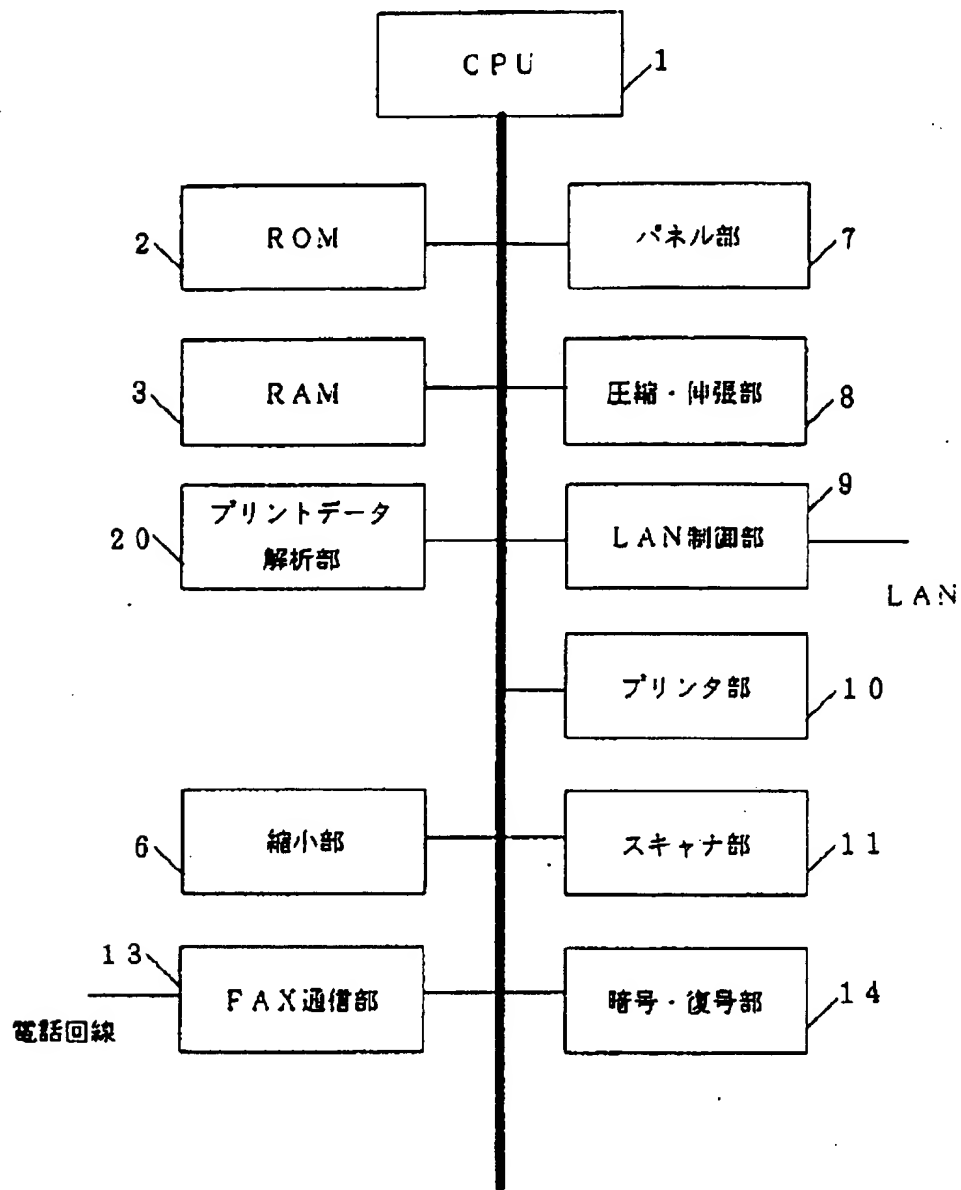

0011 0000 → 3 0

[Translation done.]

Drawing selection drawing 16

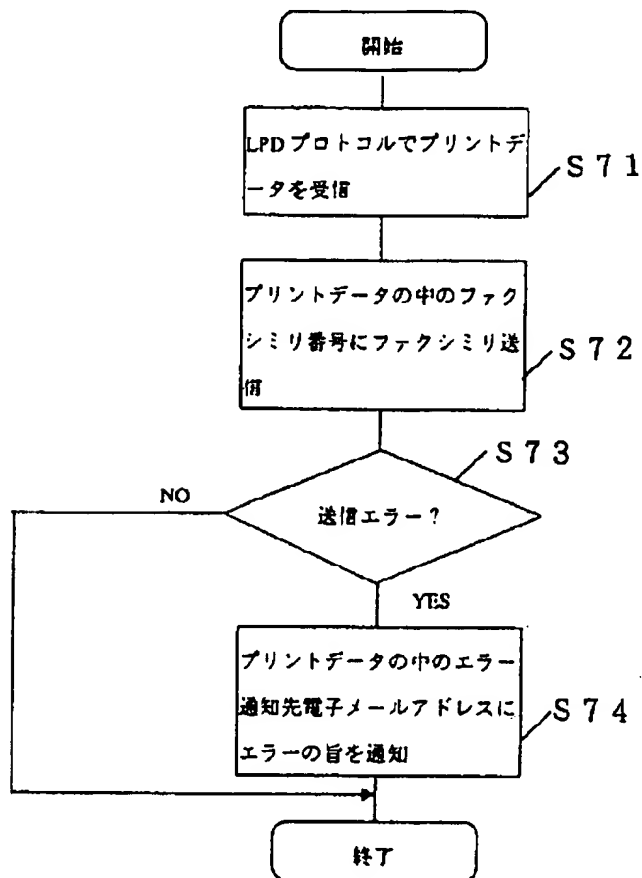
ファクシミリ送信がエラーのときのフロー

[Translation done.]

Drawing selection drawing 17 

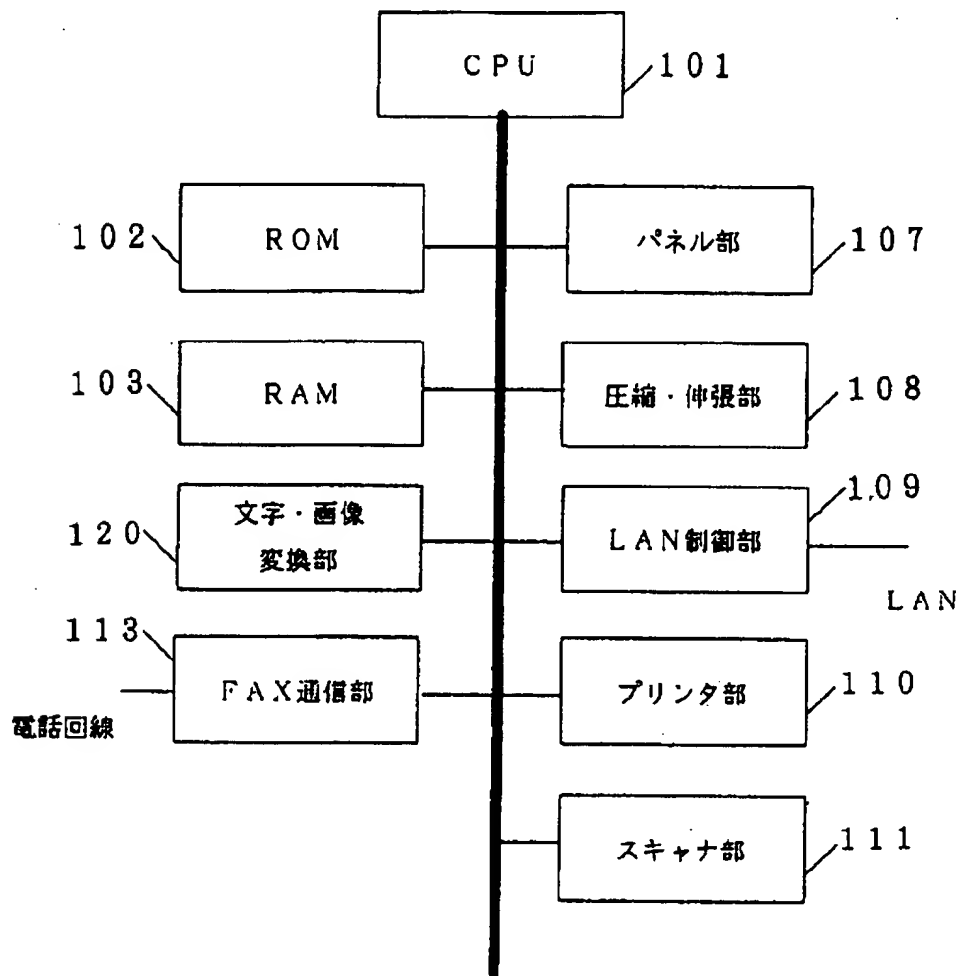
プリント指示を受け付けてファクシミリ送信する概略ブロック図

[Translation done.]

Drawing selection drawing 18

プリント指示を受け付けてファクシミリ送信するフロー

[Translation done.]

Drawing selection 

従来の電子メールを利用したファクシミリの概略ブロック図

[Translation done.]